

TABLE 3.—Free air resultant winds (meters per second) based on pilot balloon observations made near 7 a. m. (E. S. T.) during October, 1930—Continued

	Medford, Oreg. (410 meters)		Memphis, Tenn. (145 meters)		New Orleans, La. (25 meters)		Omaha, Nebr. (321 meters)		Royal Center, Ind. (225 meters)		Salt Lake City, Utah (1,204 meters)		San Francisco, Calif. (2 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)		Phoenix, Ariz. (356 meters)		Brownsville, Tex. (12 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface	S 15 E	0.6	N 73 E	0.8	N 53 E	2.0	S 6 W	0.4	S 18 W	0.7	S 36 E	2.2	Cal.	Cal.	S 27 E	1.3	N 38 W	0.5	S 84 E	2.4	N 62 E	0.7	S 84 E	2.4
500	S 26 E	0.1	N 65 E	0.7	S 89 E	6.5	S 51 W	2.6	S 30 W	3.4	S 29 W	2.3	S 74 W	1.6	S 11 W	3.2	N 26 W	4.4	S 87 E	2.6	S 69 E	5.7	S 87 E	2.6
1,000	S 2 W	0.7	S 87 W	0.7	S 74 E	4.3	S 80 W	5.0	S 74 W	3.9	S 23 E	2.6	N 76 W	4.4	N 35 W	2.2	N 27 W	5.8	S 60 E	1.9	S 50 E	5.1	S 60 E	1.9
1,500	S 31 E	0.7	N 52 W	2.6	S 85 E	2.2	S 85 W	7.0	N 75 W	4.4	S 23 E	2.6	N 76 W	4.4	N 35 W	2.2	N 27 W	5.8	S 60 E	1.9	S 50 E	5.1	S 60 E	1.9
2,000	N 84 W	0.9	N 26 W	2.9	N 27 E	1.6	S 88 W	6.3	N 75 W	4.4	S 23 E	2.6	N 76 W	4.4	N 35 W	2.2	N 27 W	5.8	S 60 E	1.9	S 50 E	5.1	S 60 E	1.9
2,500	S 85 W	2.9	N 14 W	4.3	N 21 E	1.1	S 88 W	7.7	N 75 W	4.4	S 23 E	2.6	N 76 W	4.4	N 35 W	2.2	N 27 W	5.8	S 60 E	1.9	S 50 E	5.1	S 60 E	1.9
3,000	N 68 W	3.8	N 16 E	4.0	N 19 W	2.4	S 88 W	7.8	N 75 W	4.4	S 23 E	2.6	N 76 W	4.4	N 35 W	2.2	N 27 W	5.8	S 60 E	1.9	S 50 E	5.1	S 60 E	1.9
4,000	N 34 W	4.7			N 2 W	4.8			N 61 W	1.2	N 32 W	4.1	N 17 W	5.5	S 75 W	6.2	S 56 W	6.4	N 42 W	7.2	S 46 W	4.2	S 18 W	2.7
5,000									S 39 W	1.4			N 30 W	6.3							S 76 W	2.8	S 54 W	5.4

TABLE 4.—Observations by means of kites, captive and limited-height sounding balloons during October, 1930

	Broken Arrow, Okla.	Due West, S. C.	Ellendale, N. Dak.	Groesbeck, Tex.	Royal Center, Ind.
Mean altitudes (meters) m. s. l., reached during month	2,824	2,653	2,508	2,469	2,716
Maximum altitude (meters) m. s. l., reached and date	13,978	14,784	15,080	14,233	14,986
Number of flights made	24	32	31	22	28
Number of days on which flights were made	24	31	29	22	28

1 24th. 2 11th. 3 8th. 4 26th. 5 16th.

In addition to the above there were approximately 130 pilot balloon observations made daily at 56 Weather Bureau stations in the United States.

WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By M. C. BENNETT

GENERAL SUMMARY

Except during the first few days, the first half of October was warmer than usual over the eastern two-thirds of the country, the temperature being especially high in the central and northern regions, while in the western third near normal temperatures prevailed. During the latter half of the month much colder weather prevailed with generally subnormal temperatures from the Mississippi Valley eastward.

The precipitation for October was heavy throughout most of the Plains States and in the west Gulf area, where some sections received from two to six times the monthly normal. The northern Plains, and the northern Rocky Mountain States had much more than the average, and the States just west of the Mississippi River and the east Gulf States received amounts near the normal, while the monthly totals were much below the average in most of the Lake region and from the Ohio Valley eastward. The scantiest falls again occurred in the interior of the Middle Atlantic States, portions of which received less than one-fourth of the October average. The far Southwest and portions of the Great Basin and Pacific Coast States also received scanty precipitation.

TEMPERATURE

October was the first month since January to average cooler than normal over much more than half of the country. Conditions changed considerably from week to week, but for the month no State averaged more than slightly warmer than normal and but few more than moderately cooler than normal.

The first week was cool east of the Mississippi River but warm over most districts to westward, especially in

the lower Missouri Valley and the far Northwest. The second week was warmer than normal practically everywhere save west of the Rocky Mountains, and was particularly warm in the north-central portion. From the middle of the month onward cool weather predominated, except in the far Southwest. A marked cold period visited Montana and the Dakotas late in the middle decade of the month and passed southeastward to the Atlantic coast by the first portion of the final decade. In addition, the closing days of October were quite cold in the north-central portion of the country.

The month averaged cooler than normal in most regions, especially in the southern Appalachian area, in Indiana and adjacent districts, and from the central portions of the Dakotas westward to the Cascade Mountains. A large part of Montana averaged more than 4° colder than normal.

Portions of California and of the Rio Grande Valley averaged warmer than normal, also some parts of the Lake region and New England.

The highest temperatures in the far Northwest were noted early in the month, but in most States west of the Mississippi late in the first decade. From the central valleys northeastward and eastward the highest marks were reached usually during the period from the 11th to the 14th, and in a few States they were close to the previous records of October high temperatures.

The lowest marks were reached about the 17th in the northern portions of the Plains and the Rocky Mountains, and about the 22d in the majority of States east of the Mississippi River. Several States of the upper Ohio Valley, or the middle or south Atlantic coast equaled or very closely approached their previous October records at this time. In some of the Southeastern States and in most of the States west of the Mississippi River the lowest marks occurred during the last six days of October.

PRECIPITATION

There was heavy precipitation during the first week of October over nearly all of Texas and considerable over the Plains region and most of Wyoming, Arkansas, and western Louisiana. During the second week there was much better distribution, with moderately large falls in portions of the Southeast and the near Southwest, and of the Plateau and Pacific coast regions, also in the vicinity of Lake Michigan. From the middle of October onward to the end there usually was less precipitation than during the first fortnight, yet considerable occurred in the Pacific Northwest, in the west Gulf region and near Southwest, in the Northeast, and just before the month closed, from southeastern Louisiana to southern Virginia.

The month brought much more than October's normal precipitation to the Plains region, especially the western portion, and to practically all parts of Texas. There was usually somewhat more than normal in eastern Idaho, Wyoming, and southern and western Montana, also in Arkansas and Louisiana. Most other districts west of the Mississippi River received less than normal, especially California, southern Oregon and Arizona, and the middle Missouri Valley.

East of the Mississippi River almost every State averaged drier than normal, with notable shortages in the Ohio Valley and from Pennsylvania southwestward over the southern Appalachians. There was somewhat more than normal in certain parts of the Southeast, in some New England coast districts, and in northern Illinois.

SNOWFALL

October brought comparatively little snowfall, considering the country as a whole.

In the southernmost States of the far West, even the loftiest stations had but scanty snowfall, but most high-land stations of Washington, of the middle and northern Plateau, and of the middle and northern Rocky Mountain region had moderate amounts.

From northeastern Washington eastward to Montana and southeastward to central Nebraska there was a considerable fall for October about the 14th to 18th.

From northern Minnesota eastward to the Adirondack region considerable snow occurred about the 16th to 20th, with notably heavy falls over the northern half of Michigan on the 17th and 18th.

Northern New England was visited by a moderately heavy snowstorm about the 24th, and most of Iowa and eastern Nebraska, with some portions of adjoining States, by a moderate fall on the 29th and 30th.

SUNSHINE AND RELATIVE HUMIDITY

Much cloudy weather prevailed in the northern border States, but generally, the southern two-thirds of the country, except the Florida Peninsula and southern Texas, had a large amount of sunshine, and the southern half of the Rocky Mountains and westward to the Pacific had considerably more than the average, while southwestern Arizona and southeastern California received from 90 to 97 per cent of the possible.

The relative humidities were generally below the normal in the Mississippi Valley and eastward as far north as the lower Lake region and southern portions of New York and the New England States; also in the Pacific States and far Southwest they were below the average. Elsewhere the humidities were generally above the normal, but with no unusual departures therefrom.

SEVERE LOCAL STORMS, OCTOBER, 1930

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path yards ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Elk Creek, Colo.	3					Destructive hail	No details reported	Official, U. S. Weather Bureau.
Forest District, N. Mex.	5	P. m.	2-4 mi.		\$5,000	Hail	Crops and buildings damaged; stock injured	Do.
Opelousas, La.	7	8:30 a. m.	100		30,000	Tornado	Cotton compress demolished; several houses damaged; path 200 yards.	Do.
Yakima and Spokane Counties, Wash.	14					Wind	Apples blown off	Do.
Field, N. Mex. (near)	15		2-4 mi.		5,000	Hail	Crops and buildings damaged; stock hurt	Do.
New Burnside, Ill.	16					Wind and electrical.	Several small buildings blown down; a house damaged; and a cow killed.	Do.
Buffalo, N. Y., to Erie, Pa.	18-19					Snow	Highways obstructed; apple trees broken; telephone and power lines down in places; transportation lines hampered; roofs collapsed.	Do.
Roswell, N. Mex. (22 miles southeast)	1	1-2 a. m.				Hail	Cotton and apples severely damaged	Do.
Hope, N. Mex.	1	P. m.	2 mi.		27,000	do.	Crops and fruit damaged; sheep and goats killed or injured; roofs pierced.	Do.
Roswell, N. Mex.	1	do.	1,760-2,640		90,000	do.	Cotton and alfalfa beaten, windows broken, buildings damaged, car tops perforated.	Do.
Carlsbad, N. Mex.	1-2					Hail and rain	Heavy damage to crops, houses and trees.	Do.
Pennington, N. Mex.	1-2					Hail	Crops and other property damaged; stock injured	Do.
Fowler, Colo. (near)	2	3 p. m.	880	3	30,000	Tornado and hail	Houses, farm buildings and equipment and 3 autos totally wrecked; 3 persons injured.	Do.
Peetz, Colo.	2	5:30 p. m.	9 mi.			Hail	Windows and roofs pierced.	Do.
Atoka, N. Mex.	2	P. m.	1-2 mi.			Rain and hail	Crops ruined; roofs and autos damaged; stock injured.	Do.
Parker, Colo.	3	3-3:15 p. m.	8 mi.			Hail	Roofs, windows, and auto tops damaged	Do.
Byers, Colo.	3	5:30 p. m.	3-4 mi.		10,000	do.	Stock injured; poultry killed	Do.
Artesia and Stead, N. Mex.	3	P. m.				do.	Extensive crop loss; other property damage	Do.

¹ "Mi." signifies miles instead of yards.